DOCUMENT RESUME

ED 350 640 CS 507 987

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TITLE To Be or Not To Be: An Exploration of E-Prime, Copula Deletion and Flaming in Electronic Mail.
PUB DATE Feb 92
NOTE 13p.; Paper presented at the Annual Meeting of the Western States Communication Association (63rd, Boise, ID, February 21-25, 1992).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Electronic Mail; Higher Education; Language Attitudes; Language Research; *Language Styles; *Semantics; *Verbs; Writing Research
IDENTIFIERS *Copula Deletion (Grammar); *E Prime; General Semantics Paradigm (Korzybski)

ABSTRACT

A study explored the efficacy of the general semantic technique of E-Prime (a technique for increasing awareness of abstraction through the deliberate deletion of all forms of the verb "to be") through a study of copula deletion (omission of auxiliary verbs) and flaming (the fervent exchange of emotionally charged messages) in electronic mail. A computer program was developed that administered an interactive questionnaire to 227 users of an electronic mail system at a major university. Results indicated that: (1) fewer than half of those surveyed were aware of either copula deletion or flaming in electronic mail; (2) the most frequently cited motivation for copula deletion was the desire to write messages quickly; and (3) no statistically significant relationship was found between copula deletion and flaming in electronic mail. Findings suggest that the omission of the verb "to be" does not by itself convey the advantages of E-Prime. Findings also suggest that copula deletion and flaming are not as widespread in electronic mail in a university setting as they may be in other settings, perhaps because of a greater stigma attached to nonstandard English usage. (Four charts and three tables of data are included; 27 references and the questionnaire are attached.) (Author/RS)

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Abstract

The efficacy of the general semantic technique of E-Prime was explored in this study of copula deletion (omission of auxiliary verbs) and flaming (the fervent exchange of emotionally charged messages) in electronic mail. Copula deletion and flaming have been previously identified as characteristics of electronic mail, while E-Prime is a general semantic technique that employs a deliberate alteration of language similar to copula deletion. If E-Prime can improve communication effectiveness and reduce misunder-standings, can copula deletion reduce the frequency of flaming in electronic mail? Or is the value of E-Prime to be found in the intent to alter linguistic habits, rather than the alteration itself? To explore these questions, a computer program was developed that administered an interactive questionnaire to 227 users of an electronic mail system at a major university. Results showed that less than half of those surveyed were aware of either copula deletion or flaming in electronic mail. The most frequently cited motivation for copula deletion was the desire to write messages quickly. No statistically significant relationship was found between copula deletion and flaming in electronic mail, leading the authors to conclude that omission of the verb "to be" does not by itself convey the advantages of E-Prime.

Introduction

The application of computer technology for communication is becoming a significant area of study. In his overview of research on computer-mediated communication systems, Rice (1989) claimed that this area has received "increased attention" from a variety of disciplines, and he specifically notes the interest of scholars of communication, information science and management science. The need for understanding the influence of computers on how we communicate is expressed eloquently by Chesebro and Bonsall (1989):

> ...computerization is establishing an archetypal metaphor for human talk that is emerging as a controlling philosophy, if not ideology, in the United States. Technology and communication are now intimately interrelated. The terminologies, attitudes, and values utilized to describe a technology are increasingly becoming the foundation for characterizing and understanding human communication and therefore each person who finds that communication reflects and defines himself or herself. In other words, the computer revolution is now a personal issue, an issue that requires exploration, definition and analysis. (7)

Among those pursuing such "exploration, definition and analysis" are scholars of organizational communication (for example, Blackman and Clevenger, 1990; Compton, White and DeWine, 1991; Dunlap and Kling, 1991; Foulger, 1990; Komsky, 1991; Papa and Papa, 1990; Rubinyi, 1989; Rice, 1987).

One of the applications of computer-mediated communication (CMC) in organizations is the electronic mail system, in which people exchange mail messages using computer networks. Once found primarily in highly specialized and technical environments, electronic mail systems are becoming routine in many kinds of organizations, as electronic mail gains acceptance as a communication medium. (See Komsky (1991) for a discussion of how "acceptance" has been defined by researchers, including conceptualizations of "routinization," "time since adoption," and "usage.") The computer industry has seized on the rapid implementation of electronic mail systems in business, with manufacturers emphasizing the benefits of electronic mail in marketing plans; as Schaefermeyer and Sewell (1988) point out, "computer-mediated communication has become the primary focus of the computer industry" (112).

The university, in particular, has been a site for rapid growth in the implementation of electronic mail systems. Because of the university's role as an "information processing organization," Komsky (1991) identified the university as "an exemplary setting for testing the efficacy and acceptance of electronic mail as a medium of communication" (310). Shamp (1991) noted that users at nearly three thousand universities throughout the world can now exchange electronic mail messages with each other. Through the rapid implementation of campus-wide computer networks, the interconnection of university electronic mail systems through networks such as Bitnet and Internet, and a growing recognition of the value of electronic mail for scholarly exchange, electronic mail is becoming an important form of communication in academic organizations.

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Two qualities of electronic mail messages that have been reported in the literature are flaming and copula deletion, and these two qualities represent the primary focus of this research. Our research explored the extent of flaming in electronic mail, and attempted to identify some of the characteristics of those electronic mail users who have been exposed to flaming. We also explored the extent of and motivation for copula deletion in electronic mail messages. And by comparing the extent of flaming and copula deletion, we sought to test one of the premises of the general semantic technique of E-Prime, a technique for increasing awareness of abstraction through the deliberate deletion of the verb "to be."

A General Semantics Approach

This study was primarily exploratory in nature. Copula deletion and flaming are two characteristics of electronic mail that seem to warrant further exploration. But some readers may wonder why copula deletion and flaming would be explored together in one study. On the surface, they seem to be two disparate phenomena of electronic mail. What's the reason for combining the two in this study? On what basis do we suspect a possible relationship between them? The motivation for investigating both is derived from the theoretical foundations provided by the science of general semantics, and the general semantic technique of E-Prime in particular.

Although general semanticists disagree on how to describe their area of inquiry, a few definitions might be illustrative for the reader unfamiliar with this multidisciplin-ary approach to understanding human symbolic behavior. In a recent issue of *ETC.: A Review of General Semantics*, Robert Wanderer (1991) provides a compendium of nearly eighty different definitions of general semantics, including:

- General semantics is the science and art of understanding and of being understood. (William Pemberton)
- General semantics is a linguistic self-control which teaches how symbols are related to experience so as to make it less likely that we take too seriously the absurd or dangerous nonsense that, within every culture, passes for philosophy, wisdom and political argument. (Aldous Huxley)
- General semantics is simply the name we give to all those inquiries which take as their starting point the pre-eminence of symbols and structure in human communication, and which are dominated by the paradigm of communication as environment. (Neil Postman)

Alfred Korzybski is acknowledged as the founder of general semantics, and two of his books, *Manhood of Humanity* and *Science and Sanity* are generally considered the seminal works in the field. Although both books were published more than half a century ago (the first in 1921, the second in 1933), the discipline he founded remains a vibrant area of academic inquiry. Johnson (1991) notes that when *Science and Sanity* was published, it was seen by some as

> a formidable tome published privately by a largely unknown author—an independent scholar who lacked the "proper" academic credentials. It didn't fit the categories revered in academia—not quite philosophy, or linguistics, or psychology, or logic, or neurology, or mathematics—yet borrowing from all of these and more....Somehow it inspired many popularizations, over a hundred and fifty doctoral dissertations, and two scholarly journals, as well as many college and university courses, international conferences, and seminars. (59)

Korzybski outlined an area of scientific inquiry (what Johnson calls "an open-ended linguistic system for finding answers") that has attracted the interest of several scholars of communication.[1]

Korzybski was particularly interested in the process of abstracting that is inherent in human communication. This idea is often summarized by the phrase, "the map is not the territory," which is to say the language we use to describe reality (the map) can sometimes be confused with reality itself (the territory). Korzybski argued that humans can take abstracting for granted, a condition sometimes referred to as the "semantic reaction of identification," contributing to misunderstanding and dysfunctional communication. He developed a system for giving people a greater awareness of the process of abstraction, a system that included linguistic tools he called "extensional devices." By using these linguistic modifications, people could develop a greater awareness of the limitations of language, and a greater appreciation for the potential communication difficulties that can arise when one takes abstraction for granted.

One of the potential trouble spots in the English language, what Bourland (1968) called the "supreme irritant," is the verb "to be." Korzybski (1933) cautioned against the "is of identity"; he claimed that "the little word 'to be' appears... responsible for many human semantic difficulties" (399). Bourland (1965-66) suggested these difficulties might be overcome through the use of a sub-set of the English language, called "E-Prime," which omitted all forms of the verb "to be." Wilson (1989) claims "E-Prime provides a

[1] Johnson himself is an Emeritus Professor of Mass Communication at the University of Wisconsin-Milwaukee; other communication scholars who have contributed to the general semantics literature include Arthur Asa Berger, Joseph A. DeVito, Neil Postman and Lee Thayer.

straight-forward training technique for acquiring...a 'semantic hygiene' against the most prevalent forms of logical error, emotional distortion, and 'demonological thinking'" (316). Kellogg and Bourland (1990-91) assert that E-Prime "encourages, even forces, the user to write, speak and think more clearly and accurately" (377).

As one might imagine, using E-Prime involves quite a bit of conscious effort. It often requires recasting sentences to de-emphasize the traditional subject-predicate form. Because E-Prime greatly reduces the passive voice, the speaker or writer finds it difficult to conceal the humans involved in an assertion: Bourland (1968) claims "E-Prime tends to invite attention to the agents involved in information transactions" (60). Also, E-Prime encourages users to qualify their assertions, to trans-form identification sentences like "this is good" into less imposing constructions, like "this seems good to me."

While the general semantic technique of E-Prime requires deliberate effort, copula deletion in electronic mail appears to be a naturally occurring form of "to be" omission. Must deletion of the copula be deliberate to have therapeutic value, or is copula deletion alone sufficient to have an effect? There have been many claims, but little evidence, that this is the case. Kellogg and Bourland (1990-91) argue that intention is critical:

> While the discipline of E-Prime aims at reducing dishonesty and prejudice (prejudging) in our communications, the technique of E-Prime in no way guarantee such a result. We have found that while E-Prime can facilitate honest communication, that as in any other language, the intention of the individual involved plays the predominant controlling role. (378)

They add that some languages (such as Russian and Hebrew) often use "simple juxtaposition for identity and predication structures," resulting in sentences that literally translated into English would appear as "I farmer," an example they provide that is quite similar to the sentences employing copula deletion in electronic mail. They conclude that the absence of "to be" alone "does not necessarily confer any advantages to it" (379). Yet they cite no specific research that supports this claim.

An electronic mail system therefore seems to provide a unique opportunity to test the assertion that simple copula deletion, without deliberate intent, by itself has no general semantic value. We reasoned that flaming could be used as a dependent measure for such a test, for it has been viewed as a dysfunctional characteristic of computer-mediated communication. For example, Kiesler, et al. (1984) note that administrators of electronic bulletin boards often monitor for flaming, "manually screening messages every few days to weed out those in bad taste" (1130). If the deletion of the copula in electronic mail did provide some of the benefits of using E-Prime, this might be revealed in a reduction of the frequency of exposure to incidents of flaming. On the other hand, if simple copula deletion in electronic mail does not seem to influence the frequency of exposure to flaming, this would support Kellogg and Bourland's claim. We turn now to a discussion of our specific research questions.

Investigating Copula Deletion, Flaming, and E-Prime: Our Research Questions

Copula Deletion. One of the characteristics of computer-mediated communication reported in the literature is the omission of nonessential linguistic elements. In their examination of the syntactic and stylistic features of text transmitted through computer networks, Ferrara, et al (1991) noted the frequent omission of finite forms of the copula (an auxiliary or "linking" verb, most often the verb "to be"). For example, when composing a message, one might write "The lecture boring today, but the discussion good" instead of "The lecture was boring today, but the discussion was good." They found the copula missing in 27% of the dialogues included in their study (20). This observation, along with other instances of linguistic abridgement, contributed to a characterization of computer-mediated written discourse as a "reduced register" (21) similar to the register of note-taking.

Although Ferrara, et al, noted the omission of the copula in computer-mediated communication, they did not assess the extent that users were aware of this phenomenon. We posed the question:

RQ1a: To what extent are users of electronic mail aware of copula deletion?

We asked our respondents whether or not they were aware of copula deletion in electronic mail. If they reported that they had noticed it, we also asked them to estimate the extent of copula deletion in the messages they read, as well as the messages they send to other electronic mail users.

Ferrara, et al, suggested that future research should explore the motivations for deleting the copula. Our study, therefore, attempted an initial assessment of the motivations for copula deletion in electronic mail messages. Thus:

RQ1b: What do users report as the reasons for copula deletion?

We presented respondents with a list of five possible reasons for copula deletion, and asked them to select which (if any) seemed the most likely reason for copula deletion.

As an additional exploration into the nature of copula deletion in electronic mail, we attempted to identify some of the characteristics of those who notice copula deletion.

RQ1c: Are there characteristics that can significantly distinguish those electronic mail users who report an awareness of copula deletion from those who don't?

We asked respondents about the amount of time they spend working with the computer, the type of computer they use most often, the number of electronic mail messages they typically receive each day, whether they subscribe to electronic mail "discussion lists," and if they do subscribe, the approximate percentage of their electronic mail they receive that is sent by discussion lists. From the responses to these questions, as well as demographic questions asking the respondents age, sex and academic position, we attempted to create a profile of the electronic mail user who is aware of copula deletion.

Flaming. Another characteristic of electronic mail, commonly called "flaming," we define as "the heated exchange of messages expressing hostility or defensiveness toward others on the computer network."[2] Baron (1984) found the frequency of flaming in computer conferencing "most striking" (130). In their study of electronic mail users in a large office equipment firm, Sproull and Kiesler (1986) reported that their respondents experienced flaming in electronic mail messages an average of 33 times a month (1508). Both of these studies suggest flaming is a widespread phenomenon in computer-mediated communication systems.

Is flaming also a frequent occurrence among users of electronic mail in a university setting? In exploring this question, we first considered the more fundamental issue of the extent of awareness of flaming among the users of electronic mail we surveyed. Thus:

RQ2a: To what extent are users of electronic mail aware of flaming?

We asked respondents whether or not they were aware of the term "flaming." If they weren't, we provided the above definition, and asked them if they had ever been exposed to an incident of flaming. We then sought to assess the frequency of exposure to flaming:

RQ2b: How often do users of electronic mail experience incidents of flaming?

We asked our respondents to estimate the number of incidents of flaming they had experienced in the past year.

We also explored the characteristics of electronic mail users who are exposed to flaming. Sproull and Kiesler (1986) suggested that flaming is an example of "uninhibited behavior" that may be due to the relative paucity of "reminders of the presence of other people and of social norms" in electronic mail (1501). We reasoned that some of the characteristics of electronic mail users we explored (see RQ1c above) might provide us with clues to the kinds of electronic mail users exposed to flaming. Thus:

RQ2c: Are there characteristics that can discriminate between those who are exposed to flaming, and those who are not?

Using the responses to our questions of computer usage and electronic mail habits, as well as our demographic questions, we attempted to create a profile of electronic mail users who have been exposed to flaming.

E-Prime. The presence of both copula deletion and flaming in electronic mail seems to provide an opportunity to test the general semantic technique of E-Prime, and in particular, the efficacy of deleting the verb "to be" as a linguistic alteration. We explored whether or not omission of the verb "to be" by itself offers any of the benefits of E-Prime, as reflected in the frequency of exposure to flaming. Thus:

RQ3: Is there a relationship between copula deletion and flaming in electronic mail?

We compared our respondents' estimates of copula deletion with their estimated frequency of exposure to flaming. If a negative correlation was found (that is, if greater copula deletion was associated with fewer incidents of flaming) this would seem to indicate there may be value in deleting the verb "to be," regardless of one's intent. On the other hand, if no correlation was found, this would provide evidence in support of the claim of Kellogg and Bourland (1990-91) that deletion of the verb "to be" by itself does not necessarily provide any advantages.

Procedures

The Sample. Subjects for this study consisted of those who voluntarily responded to an invitation to participate in the research project. An electronic mail message was sent to all users of the electronic mail

[2] Although we have provided a definition of flaming, there are a number of other definitions in the literature. Baron (1984) included in her description of flaming the characteristics of "speaking incessantly, hurling insults, [and] using profanity" (130). According to *The Hacker's Dictionary*, (Steele et al., 1983) flaming means "to speak rabidly or incessantly on an uninteresting topic or with a patently ridiculous attitude." Kiesler et al. (1984) define flaming as "the practice of expressing oneself more strongly on the computer than one would in other communication settings" (1130).

system provided by the computer center at a major research university, inviting them to take a short survey on electronic mail usage. Although messages were initially sent to a total of 1,233 electronic mail addresses provided by the director of the computer center, 184 were returned as undeliverable mail (primarily rejected by the mail system as having invalid electronic mail addresses), resulting in a pool of 1,049 electronic mail users. Three weeks after the initial messages were sent, a follow-up message was sent to those who had yet to take the survey. We received a total of 227 responses, resulting in a response rate of 21.6%. Men (79.7%, N=181) outnumbered women (20.3%, N=46) in our sample, which included 2 1 undergraduate and 65 graduate students, 66 faculty members, and 75 respondents in staff or other non-academic positions. Most respondents used either an Apple Macintosh (42%, N=96) or IBM compatible computer (41%, N=93). Ages of our respondents ranged from 20 to 68, with an average age of 35.55 years (SD=10.05).

The Questionnaire. A computer program was created to administer the questionnaire. This program was written using the "command procedure" language of the VMS operating system on a Digital Equipment VAX computer. Ten questions were asked of all respondents, and up to nine additional questions were asked depending on responses to three "screening" questions. (For example, if a person responded that he or she had not been exposed to flaming, the question asking for an estimate of the frequency of flaming was not asked.) Five of the questions were copula deletion items, five questions related to flaming, and five measured electronic mail and computer usage habits. There also were three demographic questions (sex, age and academic position) and one question asked if the participant would be willing to take electronically-administered surveys of this nature in the future. Two of the questions were open-ended (one question on copula deletion and one on flaming), seeking from the respondent extended narrative answers; the remaining questions were closed-ended, "forced-choice" items. A summary of the design of the questionnaire can be found in the appendix attached to this paper.

Data Analysis. Responses to the questionnaires were sent to one of the authors of this study in the form of three electronic mail messages. One of these messages contained the numeric data from the closed-ended questions, the other two messages contained the narrative data from the open-ended questions. The Statistical Package for the Social Sciences (SPSS) was used for data analysis of the quantitative data; the primary statistics used were frequencies and t-tests. An analysis of data from the open-ended questions is not reported here; the results of a content analysis of this data will be presented in a separate paper.

Results

RQ1a: To what extent are users of electronic mail aware of copula deletion?

We presented our respondents with a description of copula deletion, and asked them if they had noticed it in the electronic mail messages they had read. A slight majority of our respondents (52.4%, N=119) stated that they were not aware of copula deletion in electronic mail messages, over a third (38.3%, N=87) reported they had noticed it, with the remainder stating they didn't know for sure (9.3%, N=21). Note that this item was a measure of awareness, and not a direct measure of the amount of copula deletion.

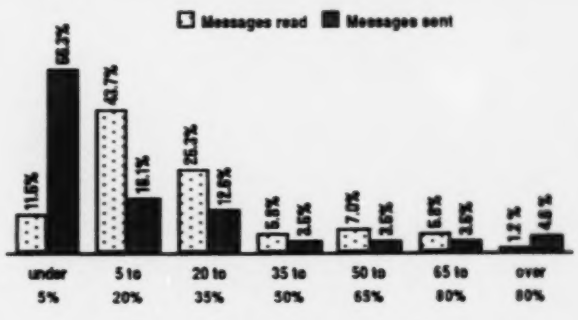
We obtained such a measure, although indirectly, by asking those who were aware of copula deletion to estimate the percentage of messages they had read (and sent) that contained instances of copula deletion. Our data suggest that copula deletion, when it is perceived by electronic mail users, is not seen as a frequently occurring phenomenon. Over half (55.2%) of our respondents estimated that copula deletion occurred in no more than 20% of the messages they read. Our respondents noticed copula deletion more in the messages they read than in the messages they sent; almost three-fourths (72.4%) estimated that they employed copula deletion in no more than 20% of the messages they send. Chart 1 presents a summary of our responses to these questions.

These figures are similar to the finding of Ferrara, et al. (1991) of copula deletion in 27% of the messages in their sample. Although Ferrara, et al. looked at synchronous computer conferencing, our data suggest that copula deletion may be similarly characteristic of asynchronous electronic mail. This lends some support to the assumption that research in computer conferencing can provide useful insights for studies of electronic mail.

Chart 1

Extent of copula deletion

Percentage of respondents estimating percentage categories for copula deletion in messages read and sent. (N=87)



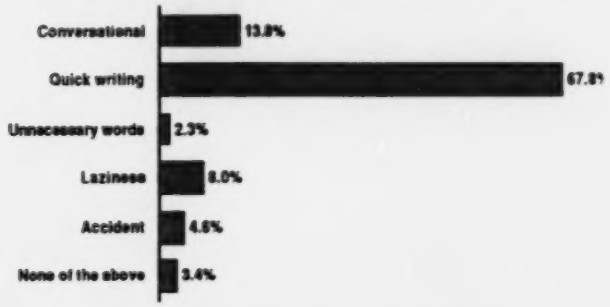
RQ1b: What do users report as the reasons for copula deletion?

If respondents were aware of copula deletion in electronic mail messages, we asked them to assess the reasons for copula deletion. We presented respondents with five possible reasons for copula deletion, and asked them which, if any, of these reasons seemed the most plausible. The results of this question are summarized in Chart 2. The majority (67.8%) of the respondents attributed copula deletion to the motive "in order to write quickly." About one out of seven respondents felt copula deletion was motivated by a desire to make messages sound more conversational. Since much of the E-Prime literature suggests that the verb "to be" is an unnecessary part of the English language, we included in our question the response "because these words aren't needed"; however, this motivation was selected by the smallest number of respondents in our study. This suggests that although copula deletion and E-Prime may share the semantic reduction of omitting forms of the verb "to be," they seem to have dissimilar motivations. If motivation is the critical factor of the E-Prime technique, then the copula deletion characteristic of computer-mediated communication is unlikely to have a siginficant effect on the "emotional distortion" of language, which we measure here as "flaming."

Chart 2

Motive for copula deletion

Percentage of respondents choosing the following motives as the most plausible explanation for copula deletion. (N=87)



RQ1c: Are there characteristics that can significantly distinguish those electronic mail users who report an awareness of copula deletion from those who don't?

Using T-tests, we compared those who were aware of copula deletion with those who weren't across five independent variables. Only the variable "age" showed a significant difference (p=.031), indicating that those who were aware of copula deletion tended to be younger. The variable "number of E-mail messages received each day," approached a significant difference level (p=.079). Although those respondents aware of copula deletion reported being exposed to a higher average number of flaming incidents during the previous year, the difference was not statistically significant (p=.261). Results of these T-tests are summarized in Table 1.

RQ2a: To what extent are users of electronic mail aware of flaming?

Slightly more than half (52%, N=118) of our respondents were aware of flaming. Of the remainder, 43.6% (N=99) reported that they were not aware of flaming, and 4.4% (N=10) said they didn't know. We asked those respondents who said they were aware of flaming to provide a definition for it. Upon close examination of these definitions, we found 19 that clearly described the term flaming outside of the electronic mail context (most of these defined flaming as either "homosexual" or "on fire"). Removing these cases reduced the number of those who were aware of flaming (as related to electronic mail) to 99 (43.6%). It was unclear, however, if these respondents provided definitions of flaming outside of the electronic mail context because of a lack of awareness of flaming as a characteristic of electronic mail; it could be that some of these respondents knew of flaming as a term related to electronic mail, but chose to define it in other terms.

In any case, we have greater confidence in the question that inquired about actual exposure to flaming. After providing our definition of flaming ("the fervent exchange of messages, often personally attacking and/or expressing defensiveness, on computer communication networks"), we asked respondents whether they had ever been exposed to an incident of flaming. Well over half (58.2, N=132) reported that they had not been exposed to flaming, while 39.2% (N=89) reported that they had, and 2.6% (N=6) said they didn't know. A comparison of the flaming awareness and exposure items is provided in chart 3.

Chart 3

Comparing awareness of flaming with exposure

Percentage of "yes," "no" or "don't know" responses. (N=227)

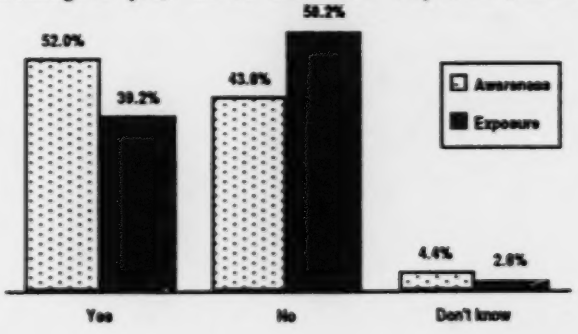


TABLE 1
Comparison of those aware of copula deletion with those unaware of copula deletion

Variable	Aware			Unaware			*t*	*df*	*p*
	Mean	*N*	*SD*	Mean	*N*	*SD*			
Hours/week with computer	5.86	87	2.30	5.72	119	2.07	0.45	204	0.650
E-mail messages per day	2.69	87	1.98	2.24	119	1.58	1.77	159.8*	0.079
% of E-mail from lists	3.18	44	2.00	3.36	50	2.23	-0.41	92	0.686
Frequency of flames past year	4.66	41	2.56	4.03	39	2.43	1.13	78	0.261
Age of respondent	33.70	86	9.05	36.82	117	10.84	-2.17	201	0.031

TABLE 2
Comparison of those exposed to flaming with those not exposed to flaming

Variable	Exposed			Not exposed			*t*	*df*	*p*
	Mean	*N*	*SD*	Mean	*N*	*SD*			
Hours/week with computer	6.65	89	1.89	5.23	132	2.16	5.03	219	<.0005
E-mail messages per day	3.43	89	2.35	1.80	132	.903	6.21	105.6*	<.0005
% of E-mail from lists	3.78	58	2.14	2.87	39	2.20	2.02	95	.046
Copula deletion in messages read	2.80	41	1.25	2.63	43	1.53	.58	82	.564
Copula deletion in messages sent	2.12	41	1.86	1.98	43	1.55	.39	82	.698
Age of respondent	34.38	88	9.32	36.52	130	10.57	-1.54	216	.126

TABLE 3
Comparison of those aware of flaming with those unaware of flaming

Variable	Aware			Unaware			*t*	*df*	*p*
	Mean	*N*	*SD*	Mean	*N*	*SD*			
Hours/week with computer	6.45	118	1.98	5.10	99	2.17	4.78	215	<.0005
E-mail messages per day	3.00	118	2.19	1.82	99	.96	5.32	166.5*	<.0005
% of E-mail from lists	3.75	67	2.25	2.77	31	2.05	2.05	96	.043
Copula deletion in messages read	2.67	49	1.33	2.85	33	1.50	- .55	80	.581
Copula deletion in messages sent	2.08	49	1.68	2.24	33	1.92	- .40	80	.690
Age of respondent	34.90	116	9.54	37.04	98	10.63	-1.55	212	.121

* Because of dissimilar variances, separate variance estimates of *t* were used.

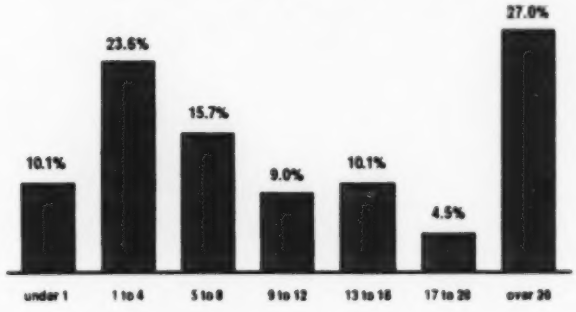
RQ2b: How often do users of electronic mail experience incidents of flaming?

We asked those who had been exposed to flaming to estimate the number of incidents of flaming they had experienced in the past year. A little more than a fourth (27%) reported that they had experienced at least 25 flaming incidents, and about a third (33.7%) reported experiencing less than 5 flaming incidents. The large number of respondents choosing the top catagory suggests that we may have been too conservative in establishing the upper boundary of our categories; some of our respondents may have been exposed to flaming on a weekly or even a daily basis, but our data were unable to indicate this level of frequency. The results of this item are summarized in Chart 4.

Chart 4

Frequency of Flaming

Percentages of respondents estimating number of flaming incidents in the past year (N=89)



RQ2c: Are there characteristics that can discriminate between those who are exposed to flaming, and those who are not?

As we had done with the copula deletion awareness measure, we used t-tests to compare those who were exposed to flaming with those who weren't. Of the six independent variables tested, two variables showed a highly significant difference: time per week with the computer (p <.0005), and the number of E-mail messages received per day (p <.0005). This suggests that those exposed to flaming spend more time working on the computer and received more electronic mail messages. Those exposed to flaming also received a significantly higher percentage of E-mail from discussion lists (p=.046). Although age was a significant predictor of copula deletion awareness (see Table 1), age was not significantly related to flaming exposure (p=0.126). Neither of the copula deletion variables were significant predictors of flaming exposure. The results of these T-tests are summarized in Table 2.

RQ3: Is there a relationship between copula deletion and flaming?

No significant difference was found between the variable "awareness of copula deletion" and the frequency of flaming measure, and no significant differences were found between the variable "exposure to flaming" and the two copula deletion interval measures. As an additional test for a possible relationship, we conducted t-tests between the variable "awareness of flaming" and the set of independent variables. Again, no significant differences were found with the two copula deletion measures (see Table 3.) These tests did reveal significant differences with three of the independent variables: time per week with the computer, number of E-mail messages per day, and percent of mail from discussion lists. Thus, those who were aware of flaming tended to spend more time with the computer, receive more electronic mail, and receive a higher percentage of that mail from discussion lists. However, neither awareness of flaming nor exposure to flaming were significantly related to frequency of copula deletion in electronic mail messages. Our data indicate no evident relationship between flaming and copula deletion in electronic mail.

Discussion

This study was an exploration into copula deletion and flaming in electronic mail. Our research sought to provide a quantitative description of the phenomenon of copula deletion in electronic mail, including an assessment of the level of awareness of copula deletion among electronic mail users, their estimates of the extent of copula deletion, and the reasons they think it happens. Our study also sought a better understanding of flaming: the level of awareness of flaming among electronic mail users, and the extent they have been exposed to it. We also wanted to find out which of our measures could be used to characterize those aware of copula deletion, and those exposed to flaming. And the presence of both of these phenomena provided a unique opportunity to test the efficacy of the general semantic technique of E-Prime: specifically, to investigate whether the crucial aspect of E-Prime is the deletion of the verb "to be" or the intent of the user of E-Prime to alter linguistic habits.

The results of our study show that most of the electronic mail users in our sample were unaware of copula deletion and unexposed to flaming. This may be due to different levels of observance and sophistication among our respondents, but it may also indicate that copula deletion and flaming are not as widespread in electronic mail in a university setting as they may be in other settings. Perhaps copula deletion is less frequent in an academic setting because of a greater stigma attached to nonstandard English usage. Perhaps flaming

is more common in non-academic settings where the average user may be younger and more likely to use electronic mail for socialization.

There was a segment of our sample, however, that did show high levels of awareness of and exposure to flaming. Those users who subscribed to discussion lists were much more likely to be exposed to flaming, and the higher the percentage of mail from discussion lists, the greater the frequency of exposure to flaming. Sproull and Kiesler (1986) noted that flaming may be related to the lack of "reminders of the presence of other people" (1501); it may be that flaming is more likely to occur in mail from discussion lists because the reader attributes the discussion list as the source of the message, rather than the actual sender of the message. Indeed, the mail system used by respondents in our sample listed the discussion list address, and not the sender's address, in the mail directory. While the sender's address usually appears in the header of messages, electronic mail addressess can be relatively cryptic and provide few immediate clues to a sender's acutal identity. Discussion lists also provide the opportunity to send and receive messages from previously unknown individuals, which could lead to a more impersonal, more computer-like image of the electronic mail "partner," a phenomenon Shamp (1989, 1991) has referred to as "mechanomorphism."

We suspected there might be a relationship between flaming and discussion lists, so we included an item in our survey that asked respondents whether flaming was more likely on discussion lists or in "personal" electronic mail messages. About two-thirds (65.2%, N=58) of our respondents who had been exposed to flaming said it was much more likely to occur on discussion lists, and an additional 14.6% (N=13) said this was somewhat more likely. It seems clear to us, then, that discussion lists are a major source of flaming incidents, at least in academic settings.

We found no significant relationships between any of the copula deletion and flaming measures. We interpret this lack of relationship as support for the claim of Kellogg and Bourland (1990-91) that the intent of the user of E-Prime, rather than simple copula deletion, is the source of the efficacy of E-Prime. Copula deletion by itself does not seem to produce a reduction in exposure to flaming. What remains to be tested is whether training in E-Prime can lead to reduced exposure to flaming. While the efficacy of E-Prime as a general semantic technique has been documented elsewhere (see for example, Elkind, 1976), it is not clear whether the value of E-Prime would be influenced by communication situations where copula deletion is already present to some extent. In other words, would the presence of copula deletion in electronic mail have any influence on the benefits of deleting the verb "to be" by E-Prime users? This is an issue we feel deserves additional research.

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Appendix

The following is a transcript of the questionnaire used in this study. It was administered by a computer program that asked respondents questions according to the instructions in brackets.

[Question 1: Asked of all respondents]
In a typical week, about how many hours do you spend working with a computer?

(1) less than an hour a week
(2) one to four hours a week
(3) five to eight hours a week
(4) nine to twelve hours a week
(5) thirteen to sixteen hours a week
(6) seventeen to twenty hours a week
(7) twenty-one to twenty-four hours a week
(8) twenty-five or more hours a week

[Question 2: Asked of all respondents]
Which computer system do you use most often?

(1) IBM personal computer (or compatible)
(2) Apple Macintosh
(3) Apple II
(4) Wang
(5) Next
(6) other
(7) don't know

[Question 3: Asked of all respondents]
On the average, about how many electronic mail messages do you receive each day?

(1) less than one per day
(2) one to four per day
(3) five to eight per day
(4) nine to twelve per day
(5) thirteen to sixteen per day
(6) seventeen to twenty per day
(7) twenty-one to twenty-four per day
(8) twenty-five or more per day

[Question 4: Asked of all respondents]
Do you receive any electronic mail messages from list servers, sometimes called 'hotlines,' 'discussion lists' or 'mailing lists'?

[This would include messages you receive that are not from individuals, but are sent to you automatically by computer mail systems.]

(1) yes
(2) no
(3) don't know

[Question 5: Asked only if yes to Q4]
About what percentage of the electronic mail you receive is sent by list servers?

(1) less than 5%
(2) between 5% and 20%
(3) between 20% and 35%
(4) between 35% and 50%
(5) between 50% and 65%
(6) between 65% and 80%
(7) between 80% and 95%
(8) over 95%

[Question 6: Asked of all respondents]
Think about the electronic mail messages you have read. Have you ever noticed some messages omitting forms of the verb 'to be'--words like ARE, IS, WAS and WILL BE?

For example, a message like this:
> Hi, Sue. How you doing? Paper coming along?
> Math class good today. Quiz tomorrow.

instead of this:
> Hi, Sue. How are you doing? Is your paper coming along?
> Math class was good today. Quiz will be tomorrow.

In the messages you read, have you ever noticed people omitting forms of the verb 'to be'?

(1) yes
(2) no
(3) don't know

[Question 7: Asked only if yes to Q6]
Thinking about the electronic mail message you read, about how often do people omit forms of the verb 'to be'?

If a person does this at least once in a message, count this message in your estimate. That is, your response should represent the percentage of messages you read that contain at least one instance of omitting a form of the verb 'to be.'

On the average, about how often have people omitted forms of the verb 'to be' (at least once) in the messages you read?

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(1) less than 5% of the time
(2) between 5% and 20% of the time
(3) between 20% and 35% of the time
(4) between 35% and 50% of the time
(5) between 50% and 65% of the time
(6) between 65% and 80% of the time
(7) between 80% and 95% of the time
(8) over 95% of the time

|Question 8: Asked only if yes to Q6|
Now think about the electronic mail messages you send. About how often do you omit forms of the verb 'to be' in the messages you send?

On the average, in the messages you SEND, would you say you omit forms of the verb 'to be' (at least once in a message)

(1) less than 5% of the time
(2) between 5% and 20% of the time
(3) between 20% and 35% of the time
(4) between 35% and 50% of the time
(5) between 50% and 65% of the time
(6) between 65% and 80% of the time
(7) between 80% and 95% of the time
(8) over 95% of the time

|Question 9: Asked only if yes to Q6|
Why do you think people sometimes omit forms of the verb 'to be' in electronic mail messages?

Please give a brief description of why you think people sometimes do this.

Sometimes people omit forms of the verb 'to be' in electronic mail messages BECAUSE:

|Question 10: Asked only if yes to Q6|
Which of the following do you think is the MOST plausible explanation for why some people omit forms of the verb 'to be' in electronic mail messages?

(1) So messages sound more conversational.
(2) So messages can be written more quickly.
(3) Because these words aren't needed.
(4) Because people are lazy.
(5) It's done by accident.
(6) None of the above is the most plausible explanation.

|Question 11: Asked of all respondents|
Have you ever heard of the term FLAMING?

(1) Yes
(2) No
(3) Don't know

|Question 12: Asked only if yes to Q11|
Please give a brief definition of flaming.

FLAMING IS:

|Question 13: Asked of all respondents|
Just to make sure we are using the term the same way, please use the following description of flaming when considering the questions that follow.

Sometimes people take offense at what other people say. When this happens in computer communications, like in electronic mail messages or 'on-line' conferences, a phenomenon some have called 'flaming' can occur.

Flaming can be defined as 'the fervent exchange of messages, often personally attacking and or expressing defensiveness, on computer communication networks.'

Have you ever been exposed to an incident of flaming? That is, have you ever been a participant in an incident of flaming, or observed other people flaming?

(1) Yes
(2) No
(3) Don't know

|Question 14: Asked only if yes to Q13|
How many incidents of flaming have you been exposed to (either as a participant or an observer) in the past year?

(1) less than one in the past year
(2) 1 to 4 incidents of flaming in the past year
(3) 5 to 8 incidents of flaming in the past year
(4) 9 to 12 incidents of flaming in the past year
(5) 13 to 16 incidents of flaming in the past year
(6) 17 to 20 incidents of flaming in the past year
(7) 21 to 24 incidents of flaming in the past year
(8) 25 or more incidents of flaming in the past year

|Question 15: Asked only if yes to Q13|
Think about the incidents of flaming you have been exposed to. Which of the following best reflects the relationship between flaming, electronic mail received from list servers, and personal electronic mail messages.
On the average, would you say flaming is...

(1) much more likely to occur in messages from list servers than in personal electronic mail messages
(2) somewhat more likely to occur in messages from list servers than in personal electronic mail messages
(3) somewhat more likely to occur in personal electronic mail messages than in messages from list servers.
(4) much more likely to occur in personal electronic mail messages than in messages from list servers.

|Question 16: Asked of all respondents|
Are you
(1) a freshman
(2) a sophomore
(3) a junior
(4) a senior
(5) a graduate student working toward a master's degree
(6) a graduate student working toward a doctor's degree
(7) a faculty member
(8) university staff
(9) other

|Question 17: Asked of all respondents|
Are you
(1) female
(2) male

|Question 18: Asked of all respondents|
Please enter your age (as a two-digit number):

|Question 19: Asked of all respondents|
And finally, would you be willing to participate in future surveys of this nature?
(1) yes
(2) no

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